

movement, and at least a portion of the abrasive grains are bonded to the face having the negative angle of inclination, and whereby after the [initial] first uppermost cutting level has been worn away by cutting a workpiece, each successive uppermost cutting level of the tooth presents to the workpiece a ring of superabrasive grain around the contoured surface of the tooth, and substantially all superabrasive grain within the ring simultaneously engages in cutting.

REMARKS

Section 102 Rejection:

Applicants agree with the Examiner's summary of the Asada invention. However, electrically deposited diamond grain is not chemically bonded to the surface upon which it has been deposited. At column 2, lines 10-24, Asada discloses his method for forming the tool, with the coating of the tool's cutting surface with abrasive grain by electroforming being preferred (See also, column 3, lines 30-34.). No other coating method is suggested in the patent.

It is known that electroplated diamond tools are susceptible to peeling of the electroplated layer from the substrate during cutting operations and that such tools have a short life relative to brazed tools, such as the tools of the invention, in particular, tools made with reactive brazes. Evidence of the superiority of brazed tools over electroplated tools is provided in the 37 CFR Section 1.132 Declaration of Inventor Buljan, submitted herewith. Electroplated tools are not equivalent, alternate embodiments to chemically bonded tools and cannot anticipate the invention.

Furthermore, at column 2, lines 10-24, Asada teaches the necessity of "removing substantially all of the ultra-hard abrasive grains on the top surface of each of the teeth so as to expose the top surface to the outside." Therefore, Asada cannot anticipate Applicants' claims.

Applicants' invention includes abrasive grain chemically bonded to the surface of the teeth, including the top surface, as may be seen in the Figures. Claims 1 and 28 are amended herein to expressly recite abrasive grain in the first cutting level, i.e., on the top surfaces of the teeth.

Section 103 Rejection:

The tools of the invention having a cutting surface with teeth having a negative angle of inclination (claims 1, 3-26 and 28-34) are neither disclosed nor suggested by Asada in combination with Scott. Neither reference suggests the benefits of chemically bonded abrasive grain in metal bonded abrasive tools used for cutting hard materials, such as concrete. As seen from the data in the Buljan Declaration, the electroplated tools (e.g., the Asada type of tools) remove significantly less tungsten carbide substrate and have a much shorter tool life than brazed single layer tools in comparative grinding tests.

Applicants note the Examiner's comment regarding a disclosure in Scott at column 2, lines 43-45, that the cutting mesh is bonded to the support by brazing. Looking at the Scott disclosure at column 2, lines 19-33, and column 4, lines 50-68, and the cutting mesh patents cited by Scott and discussed in the previous response herein, no indication may be found that the abrasive grain is chemically bonded to the mesh. Therefore, **the abrasive grain is not chemically bonded to the substrate** even if the mesh is brazed to the substrate. Without a chemical bond between the abrasive grain and the mechanical support substrate of the tools, performance and life of the tools disclosed by Scott, even considering the negative rake of the cutting mesh elements, will be significantly inferior to the performance and life of the tools of the invention.

In addition, the abrasive grain is mounted on an open mesh in Scott, not on a monolithic substrate as set forth in Applicants' claims. The open mesh design clearly provides less

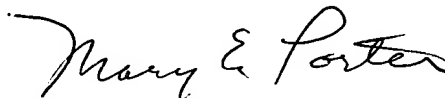
mechanical support to the diamond grain as it cuts than is provided by the monolithic substrate of the tools of the invention. The tools described by Scott would have significantly inferior tool life and performance relative to the tools of the invention.

For these reasons, Applicants invention is neither anticipated by or obvious over the cited prior art disclosures.

CONCLUSIONS

Applicants respectfully request an allowance of claims 1-34.

Respectfully submitted,

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